

2010  
MISSOURI GREEN  
**TRAINING**  
PROVIDER  
SURVEY



Department of Economic Development





## Executive Summary

The 2010 Missouri Green Training Provider Survey asked education and training institutions to provide details about green courses or programs offered throughout the state. This survey contains information gathered from education and training providers for 169 green training courses or programs.

Titles for green courses or programs ranged from Green Manufacturing and Sustainable Construction to Weatherization Technician and Solar and Photovoltaic Systems. While some green courses or programs included training for jobs in very specific green careers, many included curriculum that adds a green layer of training to an existing occupation. The Solar and Photovoltaic Systems course is one such course. An individual in an existing occupation such as electrician would add value to his or her credentials with this training in the solar field by giving themselves a marketable skill to employers.

Findings from the survey for the 20 institutions in Missouri offering green training courses or programs are provided in detail throughout this report and highlighted below.

## Survey Findings

- Most green training courses or programs were offered at *two-year, technical, and community colleges* (62%). The majority of remaining courses or programs came from *4-year colleges and universities* (33%).
- Of the green courses or programs offered in Missouri, 80 percent came from just four WIA regions: Central (47), Kansas City (31), Ozark (30), and St. Louis (27).
- Respondents were asked to list the top 3 skills which their green training would provide students. Trainers and administrators answered the following skills most often: *Environmental Impact Awareness & Reduction Strategies, Energy Auditing & Weatherization, Knowledge & Application of Alternative Energy, Natural Resource Management, and Green Construction & Design.*
- The survey also asked what specific jobs the green training is preparing students for. Top jobs most cited were: *Sustainability Specialists, Energy Auditors, Weatherization Installers & Technicians, Construction Laborers, and Environmental Science & Protection Technicians.*
- Respondents most commonly identified the following green principles which are embedded in the training: *reduction of company impacts on the environment, conservation of energy, reduction of individual impacts on the environment, and creation of renewable energy.*
- Currently, only a small portion of courses or program are producing a significant number of graduates. Five percent responded they had *greater than 100* completers and 7 percent said *between 51 and 100.*
- A major factor affecting the low number of graduates for a program was the amount of time the green training course or program has been in place. Over half of courses or programs have been offered either *less than a year* (18%) or *between 1 to 2 years* (33%).
- Enrollment for green training courses and programs is anticipated to increase. Respondents said they expect graduates to increase from previous enrollment levels in each of the following categories: *between 10 and 50, between 51 and 100 and greater than 100* and decrease in the range of *less than 10.*

Introduction

If a vibrant Green Economy in Missouri is to exist, then surely it will require a three-legged stool approach to economic growth. Without one leg, others cannot function. Those legs in Missouri’s Green Economy are education, workforce development and economic development. Without a trained and educated workforce, employers and entrepreneurs cannot confidently hire more workers or open new businesses in potential green sectors.

Recently, growth in certain green sectors of the U.S. economy are outpacing overall growth. The Pew Charitable Trusts estimates that between 1998 and 2007, clean energy jobs grew at a faster rate than overall jobs—9.1 percent for clean energy jobs compared to 3.7 percent for total job.<sup>1</sup>

In order to fill jobs in this growing green sector and others, Missouri must be ready with a prepared and educated workforce. Training providers and educational institutions are the organizations tasked with providing the prepared and educated workforce for 21st Century green jobs.

The survey examines available green training and education courses and programs, details about student enrollment, skills acquired in training, and jobs the training is preparing students for.

While Missouri-specific courses and programs are highlighted throughout this report, for those community colleges wanting to expand, enhance, or even begin green training programs, one national initiative exists to help. The SEED Center aids community colleges in developing green training courses and programs free of charge.

SEED Center: Resources for Green Training Providers at Community Colleges

A new national program which aids training providers in developing their own green training courses or programs is the Sustainable Education and Economic Development (SEED) Center. Launched in October 2010, the SEED Center provides all community colleges, for free, strategic guidance and a suite of green job workforce development resources including curricula, program guidance, career pathways and certifications, workforce projections, funding opportunities and more, in areas such as renewable energy, energy efficient technologies, green building, and building efficiency.

Partnering in this endeavor is ecoAmerica and the American Association of Community Colleges (AACC). The program aims to enable the nation’s 1,200 two-year colleges in preparing the American workforce with the skills needed to succeed in sustainable, clean tech and other green economy jobs. More than 300 community college presidents – over one-third of the AACC members – have already signed on to the initiative.

Many community colleges have already built innovative training programs preparing students for long-term careers in the green economy. From the SEED Center’s case studies:

- To meet immediate local industry demand for trained windpower technicians, Columbia Gorge College in Oregon initiated a short-term training project that led to a 92% placement rate and graduates earning \$20-24 an hour. The college has now transformed that course into a longer-term program, which forges a career path toward a two-year degree. The program has become a national model.
- Cape Cod Community College in Massachusetts began 10 years ago to train technicians for jobs in the area's burgeoning number of wind farms. Hundreds of students have earned transfer degrees in coastal management, solar technology, wastewater and other careers, including cleanup of Superfund sites at an abandoned military base.
- Oakland Community College (OCC) in Michigan has more than 350 students enrolled in its Renewable Energy program and related courses. OCC students gain field experience in the community, refurbishing public buildings with renewable materials, performing energy audits for government, and working with small businesses and hospitals to reduce waste and pollution.

To find out more about connecting to the SEED Center, visit the website at:

<http://www.theseedcenter.org>

<sup>1</sup> *Pew Charitable Trusts, The Clean Energy Economy, 2009*

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## 2010 Missouri Green Training Provider Survey

While much of the national and statewide research in the area of green jobs has focused on discovering employment levels in new and existing jobs, the analysis in this report examines green training opportunities available in Missouri. The 2010 Missouri Green Training Provider Survey was conducted from June through August 2010. The survey sought specific details about green training courses and programs, student enrollment levels, skills attained, jobs the training is preparing students for, and green practices by the institution offering the training or education. Twenty training and educational institutions in Missouri responded with nearly 170 green training programs or courses.

### Local and State Partnerships

As part of the initiative to study the state’s green economy and related areas of training, the Missouri Department of Economic Development (DED) applied for and was awarded an LMI Improvement (ARRA) research grant from the U.S. Department of Labor’s Employment and Training Administration. The purpose of the grant is to improve the level of information about green jobs and inform workforce developers, training providers and employers of the critical skills job seekers need to be successful in green career opportunities.

Partners in this endeavor include the DED’s Missouri Economic Research and Information Center (MERIC), Division of Workforce Development (DWD), Department of Natural Resources (DNR), Local Workforce Investment Boards (LWIB), and the Missouri State Workforce Investment Board (WIB).

As administer of grant activities, MERIC is the agency responsible for conducting statewide research efforts for the grant. LWIBs and WIB agencies have partnered with MERIC and were allocated funds to provide local and regional information and perspective. Local agencies began the initiative by identifying green training providers in their regions to collect information from and build relationships with to better identify local trends and insights about their regional green economies. LWIBs collected information such as institution name, program title, cost, type, length, and description, as well as current contact information.

Following the initial outreach by local partners, MERIC researchers conducted follow-up contact of training providers to gather any additional course or program titles and eliminate those which didn’t match the agency’s “green training program” definition. MERIC used the definition established in its Missouri Green

Jobs Report in order to add or eliminate institutions with green courses or programs to contact. That definition includes training courses or programs which lead to jobs that contribute to at least one of the following: conservation of energy (energy efficiency); creation of renewable energy; organic food production; reduction (or elimination) of the direct negative impacts a product, company, or individual may have on the environment; reduction (or elimination) of the direct negative impacts the environment may have on an individual; and research and development devoted to supporting any of the aforementioned functions of a green job.

### Survey Goals and Question Categories

The goal of the 2010 Missouri Green Training Provider Survey was to identify the demand and service from providers, training needs, and best practices of providers. Results were collected from the various 2- and 4-year community colleges and universities, private businesses and technical schools, apprenticeship programs, WIA providers, and other education and training institutions. Respondents were most often administrators or trainers of the specific green course or program they were responding about. These individuals were identified and contacted by phone and/or email and sent an online survey via Survey Monkey asking questions in the following four categories:

**Training Course or Program**

- Green principles
- Length offered
- Reason offered
- Classification
- Elective or required

**Student Details**

- Student enrollment
- Expected student enrollment
- Student completers
- Enrollment capacity

**Skills & Graduate Placement**

- Skills acquired
- Teaching Tools
- Graduate placement
- Type of jobs

**Institutional Practices**

- Sustainability efforts
- Institutional green practices

### Training Providers by Institution Type

There were 20 training providers responding to the survey with a total of 169 green training courses or programs in Missouri. Not all training providers in the state responded to the survey, but repeated efforts were made to follow up with each provider identified by the LWIB that potentially has a green training course or program.

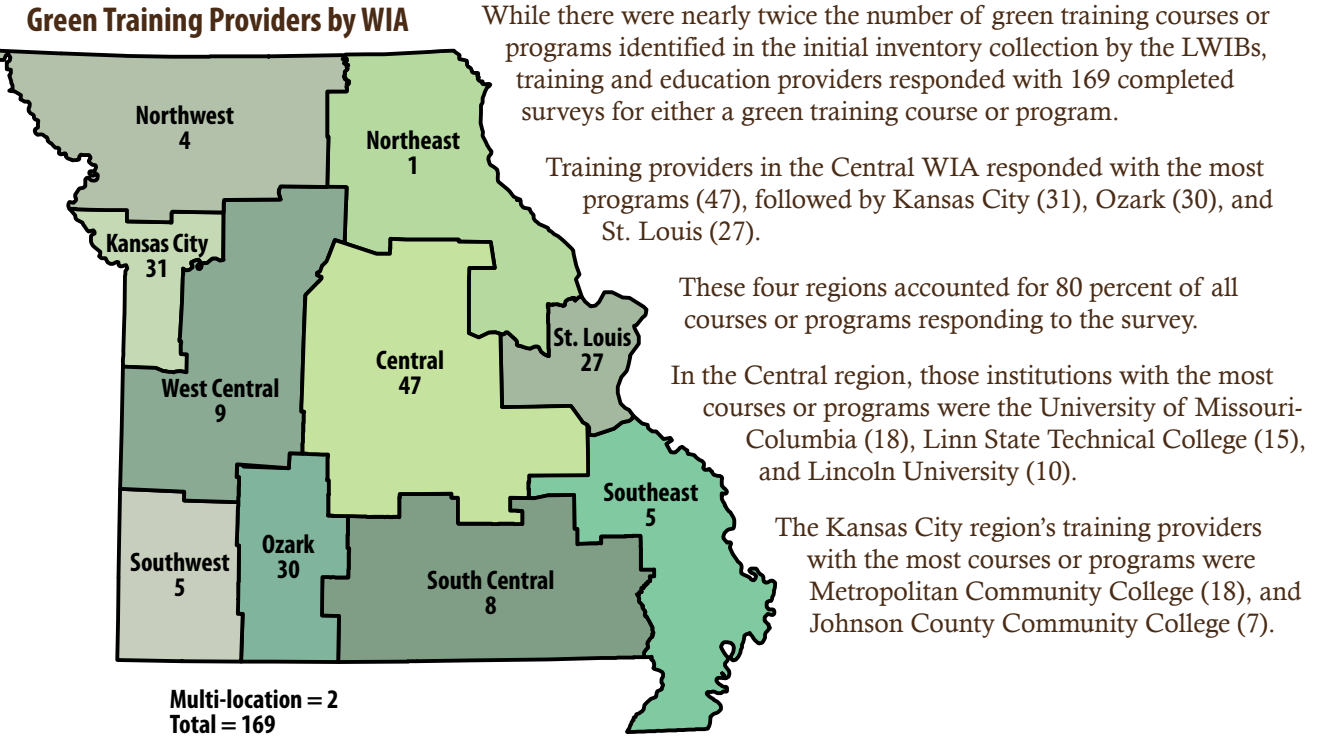
The institutions in Missouri offering the most green training courses or programs are *two-year, technical, and community colleges* with six in 10 (62%) offering at least one of the identified course or program. The majority of the remaining courses or programs came from *4-year colleges and universities* (33%). *Private business and technical schools, apprenticeship programs, WIA providers* and all *other education and training institutions* combined for five percent of all green courses or programs in the state.

Course or Program by Institution Type		
Institution Type	Number	Percent
Two-year, Technical, and Community Colleges	104	62%
Four-year Colleges and Universities	55	33%
Private Business and Technical Schools	4	2%
Apprenticeship Programs	2	1%
Other Education and Training Institutions	2	1%
WIA Providers	2	1%
Total	169	100%

Ozark Technical Community College responded with the most green training courses or programs with 19, followed by both the Metropolitan Community College (the Business & Technology and Kansas City branches) and the University of Missouri-Columbia, with 18 courses or programs offered in each of their curriculum.

### Regional Break-Out

The map below identifies 10 regions with green training courses or programs. These regions are the Workforce Investment Areas (WIA) in Missouri. Counties contained in these regions can be found on the MERIC regional profile page at the following website: <http://www.missourieconomy.org/regional/index.stm>



## Training Course or Program

The section of Training Course or Program asked training providers questions related to the purpose and design of the green course or program. The questions are dedicated to discovering the green principles embedded in the course or program, length the course or program has been offered, reason it was offered, and classifying it as one course or an entire program. If respondents indicated that the training was in the form of a course, the survey asks whether the course is elective, required, or neither.

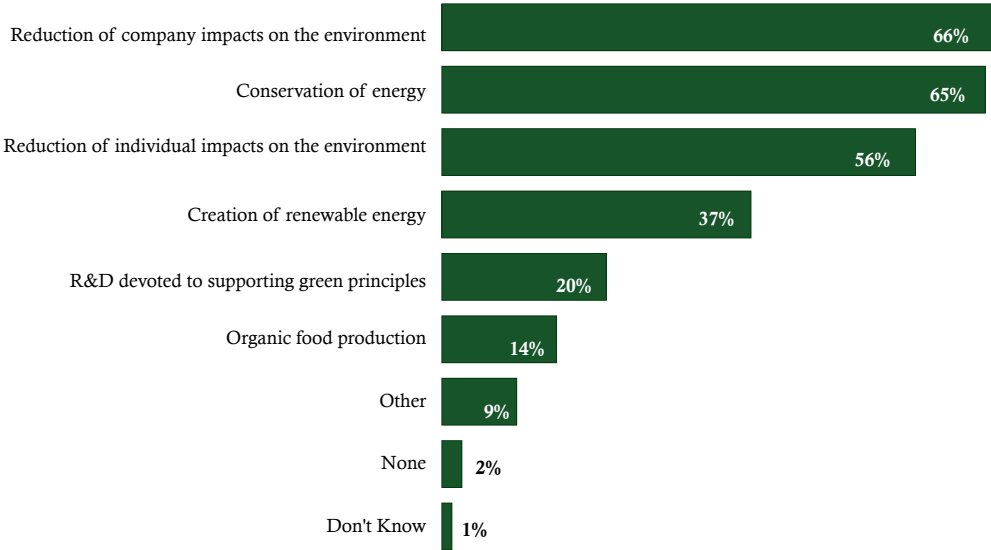
This section also contains details about two sets of highlighted courses offered at Missouri’s community colleges. Several courses offered at Metropolitan Community College in Kansas City in the field of green energy production are highlighted, along with a series of green building courses at St. Louis Community College.

### Green Principles

Respondents were allowed to select multiple responses for many of the questions throughout the survey, including the question for identifying green principles embedded in the training.

Two-thirds of respondents said *reduction of company impacts on the environment* (66%) and *conservation of energy* (65%) were the green principles embedded in the course or program. Another 56 percent said *reduction of individual impacts on the environment* and 37 percent said *creation of renewable energy* were embedded green principles in their green training course or program.

Which of the following green principles are embedded in this training course or program? (Select all that apply.)



Certain policy requirements can be key factors in deciding to offer green training courses or programs. For instance, the Missouri Clean Energy Initiative voters passed in November 2008 mandates the state’s investor-owned utilities get 15 percent of their electricity from clean, renewable energy sources. It is not surprising, then, that nearly 40 percent of respondents saw the *creation of renewable energy* as an embedded principle in their course or program. With the mandate, an increase in jobs to meet that energy demand will be necessary along with the training to support those jobs.

A green training course which exemplifies the knowledge and skills needed to develop workers to meet the increased renewable energy requirement is the Solar and Photovoltaic Systems course offered at Metropolitan Community College—Kansas City.

## Highlighted Courses in Green Energy Production: Metropolitan Community College

According to the Solar Foundation, a nonprofit solar education and research organization, in the U.S. “solar jobs are on the rise and expected to grow 26 percent in the coming year.” A report released by the group, titled *National Solar Jobs Census 2010: A Review of the U.S. Solar Workforce*<sup>1</sup> found that more than half of the country’s solar employers are planning to increase their workforce in the next year. As of August 2010, the census identified more than 16,700 solar employment sites and 93,000 solar jobs in all 50 states. These firms expect to increase solar workers by 26 percent, representing nearly 24,000 net new jobs by August 2011. To view the full report, visit the Solar Foundation website:

<http://www.thesolarfoundation.org/>

Recognizing the potential rise in solar jobs, Metropolitan Community College (MCC) offers the course Solar and Photovoltaic (PV) Systems. The course focuses on utilizing solar technology in designing and installing photovoltaic systems. The school is also developing three courses designed to accompany and build upon the existing PV course. Not offered yet, these additionally courses focus on solar technology and its application in increasing energy outputs or improving efficiencies.

### Solar and Photovoltaic Systems

The course offered at MCC is the Solar and Photovoltaic Systems course (GEOL 185). This is an elective course in the Geology Department and applies toward the fulfillment of the Associate in Arts degree. The Associate in Arts degree gives student’s a background in general education courses that can transfer to a 4-year institution, in addition to providing 17 hours of elective courses that students can focus toward their interests, such as solar technology.

The Solar and Photovoltaic Systems course examines the process of solar radiation as applied to photovoltaic technology, photovoltaic system component selection, and an introduction to safe design and installation of photovoltaic systems.



Upon completion of this course, students acquire knowledge and skills in several areas, such as a predicting solar position movements and effects of earth tilt; evaluating customers electrical system and determining whether their building would support a photovoltaic system; comparing construction, performance, and characteristics of various cell technologies; and applying correct practices and equipment for safe installation and maintenance of photovoltaic systems.

The completion of this course helps prepare students for careers in occupations such as Photovoltaic Installer and Photovoltaic Sales. While students seeking an elective in their Geology program are encouraged to enroll, the course is also designed for currently licensed electricians seeking an additional layer of knowledge and skills about solar systems to expand their opportunities for business in this field. Currently, the student enrollment is split about fifty-fifty between these two groups.

### Solar and Photovoltaic Design and Installation

Three courses being developed at MCC build upon the Solar and Photovoltaic System course and provide students the opportunity to expand their knowledge and skills in solar technology. An accompaniment course to the Solar and Photovoltaic System course will be the Solar and Photovoltaic Design and Installation (GEOL 225) course.

When offered, the expected outcomes for this course include providing students with the knowledge and skills in designing a basic photovoltaic system that is correctly sized and meets all code requirements; safely installing a basic photovoltaic and demonstrating proper roof penetration; troubleshooting a photovoltaic system for design errors and performance problems; and preparing students for the NABCEP PV Entry-Level Installer Certification exam.

<sup>1</sup> *National Solar Job Census: 2010, The Solar Foundation, 2010*



NABCEP PV Entry-Level Installer Certification

The North American Board of Certified Energy Practitioners (NABCEP) is the national certification organization for professional installers in the field of renewable energy. The organization offers the Entry-Level Photovoltaic Installer certification which is designed for those wanting to get into the solar field. Achievement of the exam allows candidates to demonstrate that they have achieved a basic knowledge of the fundamental principles of the application, design, installation and operation of grid-tied and stand-alone PV systems.

Upon completion of coursework offered by a registered NABCEP PV Entry-Level Exam provider, a student is eligible to sit for the PV Entry-Level exam. Individuals passing the NABCEP PV Entry-Level Exam should not be confused with the NABCEP Certified PV Installers. The latter can only be achieved by highly experienced individuals who have passed a much more rigorous examination and have demonstrated the capability to supervise complete PV system installations, and who have a detailed working knowledge of electrical codes, standards, and accepted industry practice associated with PV installations.

For more information about the NABCEP and their accreditation process, visit the North American Board of Certified Energy Practitioners website at:

<http://www.nabcep.org/>

Solar Water and Space Heating/Solar Thermal Design and Installation

Two related courses which MCC expects to add to their curriculum are the Solar Water and Space Heating course (GEOL 186) and the Solar Thermal Design and Installation course (GEOL 226).

The Solar Water and Space Heating course focuses on solar radiation applied to heating water and air, introducing safe design and installation of solar thermal systems with an emphasis on domestic hot water.

When offered, the expected outcomes for students in this course include providing students with the knowledge and skills in critiquing various types of solar thermal systems; applying correct practices and equipment for safe installation and maintenance of solar thermal systems; and identifying locations for roof/wall, foundation penetrations, and structural attachments.

The Solar Thermal Design and Installation course focuses on the actual design, installation and maintenance of solar thermal systems, with special emphasis on residential domestic hot water.

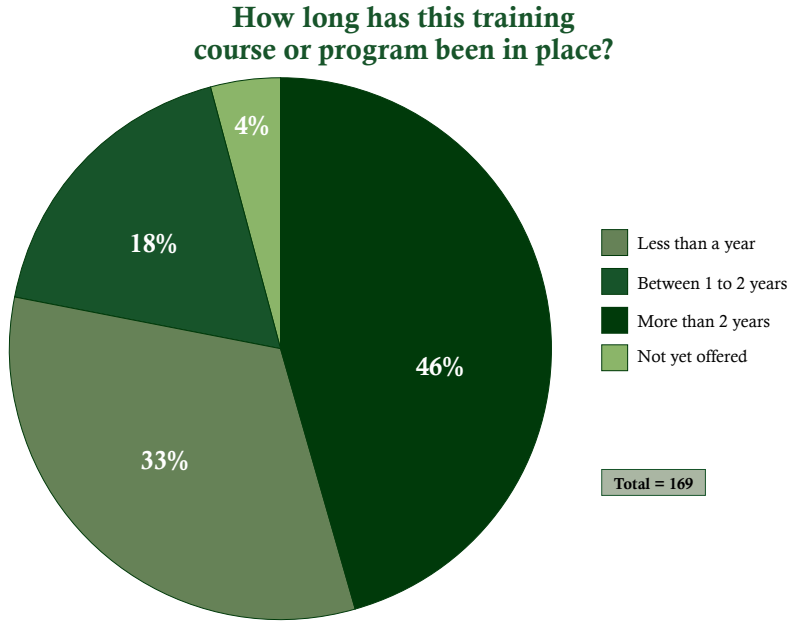
When offered, the expected outcomes for students in this course include analyzing load demand and synthesize with site-specific data to correctly size collectors, storage, and other components for a solar thermal system; calculating monthly and annual energy output; synthesizing other data to compare costs and benefits to end-users of a solar thermal system; designing a basic solar thermal system that is correctly sized and meets all code requirements; safely installing a basic solar thermal system under qualified supervision; and demonstrating correct roof penetration techniques.

For more information about this course offering and other programs, visit the Metropolitan Community College website at:

<http://mcckc.edu/main.asp>

Length Offered

The passing of the 2009 American Recovery and Reinvestment Act (ARRA) ignited a national conversation about the green economy. Transitioning to this economy will be essential for Missouri's economy if policy shifts, technology advances, and economic conditions improve in the coming years. Even prior to many of the incentives made available through ARRA and other programs, training providers in Missouri were already offering green training courses or programs. Responses reveal that nearly half of all the courses or programs in the survey have been in place for *more than two years* (46%), with the majority coming from 2-year, technical, or community colleges.



Nearly 60 percent of the courses or programs offered *more than 2 years* are at these 2-year, technical, or community colleges. Four-year colleges and universities accounted for 37 percent of those green courses or programs offered in the state for *more than 2 years*.

For courses or programs which have been in place for either *less than a year* or *between 1 to 2 years*, 64 percent were offered at the 2-years institutions, compared to 28 percent at Missouri's 4-year colleges and universities.

Clearly, two-year institutions have seized opportunities to prepare workers in green careers and they are doing so as part of their *institutional missions*, as well.

Reason Offered

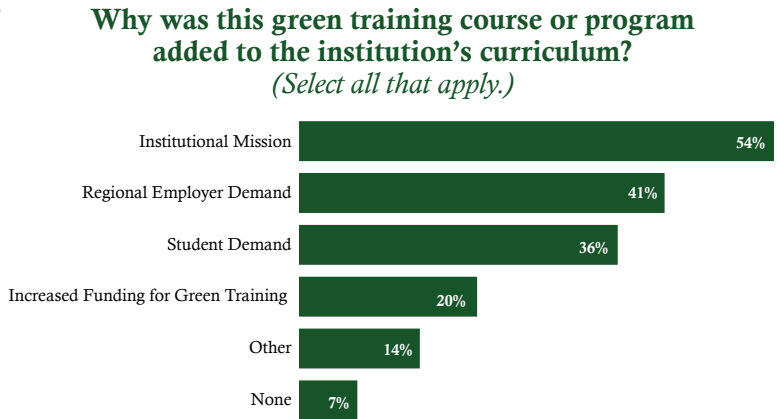
While green jobs are hardly new, government incentives and mandated requirements have brought about interest and investment in green jobs and the programs to train workers for future career opportunities.

However, increased funding doesn't seem to be a major reason why the green course or program was added to the institution's curriculum. Few respondents overall cited the *increased funding for green training* (20%) as the reason a green course or program was added to their institution's curriculum. It was cited as a reason for 2-year schools at a greater rate than for 4-years (22% vs. 9%).

Perhaps, however, it is increased awareness of a number of realities that led respondents to say it is now part of an *institutional mission*. The reality is we are now living in a period in which resources are becoming more scarce, the desire to develop new forms of energy are becoming more prevalent, and new types of products are potential means to allow us to maintain economic growth and our desired standard of living.

These could be explanations why a majority of all respondents cited *institutional mission* as the primary reason why the green course or program was added to their curriculum (54%). Other popular responses involved institutions responding to area employer and student demands regarding adding green training. Four in ten responded the green course or program was added due to *regional employer demand* (41%), while another 36 percent said due to *student demand*.

Two- and 4-year schools place varying degrees of importance that the green course or program was added because of an *institutional mission* (52% vs. 30%). Likewise, 2-year schools responded that *regional employer demand* was a greater reason for adding a green course or program than 4-year schools (41% vs. 28%).



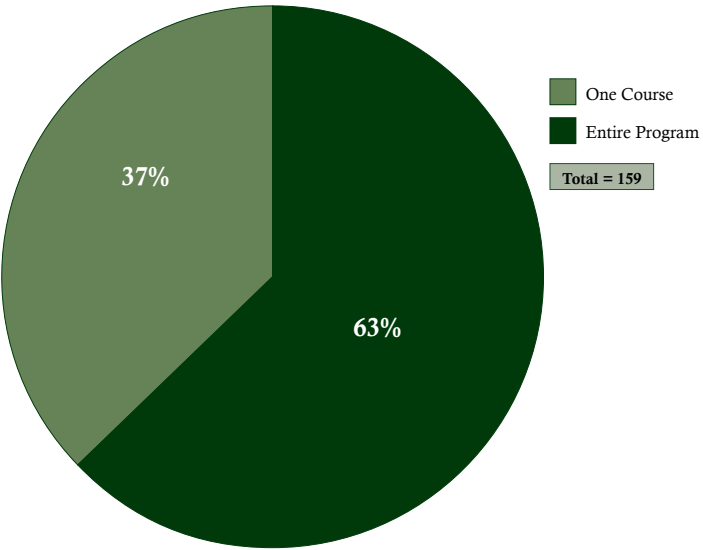
Classification

Most respondents completed surveys for green training that are an entire program, while the remaining responses are for single courses within larger programs. Many respondents who answered the survey for a single course indicated through their open-ended responses that while a single course offering was indeed green, it could not be assumed that the entire program for which it is applied is necessarily a green training program.

Nearly two-thirds of all respondents answered a survey for an *entire program* (63%), while the remaining 37 percent provided answers for just *one course* in a larger training program. Some of these entire programs are indeed green in nature, but the majority add a layer of green training to an existing program, in the form of one or sometimes multiple complimentary courses.

The majority of respondents completing surveys for an *entire program* were from 2-year institutions (67%), with most of the remaining coming from 4-year schools (26%).

Is this training one course in a larger program with other courses required; or does this training offering constitute the entire training program?



Elective or Required

Signifying the importance of many green courses, over six in ten which answered the survey for a single course said the course is *required* (63%) for a related program, with the remaining answering it is *elective* (37%).

One example of a single green course offered within a larger program and adding a layer of green training to existing knowledge are the courses in the field of green building offered at St. Louis Community College (STLCC). Two courses are highlighted on the following pages describing the courses and the process to acquire an additional layer of training in green building—the LEED certification.

Is this an elective or required course?

Response	Percent
Elective	37%
Required	63%
Total	100%

Highlighted Courses in Green Building: St. Louis Community College

Two courses offered at St. Louis Community College (STLCC) represent the opportunities at Missouri’s training and education institutions in the area of Green Building. These related courses focus on the processes for sustainable building in the U.S. and certifications for Leadership in Energy and Environmental Design (LEED) building projects.

Green Building Technologies

The Green Building Technologies course (ARC 521) is an elective course toward the fulfillment of the Associate in Applied Science degree and is listed as a course in the Architectural Technology program.

The Green Building Technologies course examines the process for producing high-performance, sustainable buildings in the U.S. and explains the process of building new or renewing existing buildings for the LEED Certification. The course discusses LEED-AP exam preparation, but does not cover the detailed preparation for LEED exams as thoroughly as another course described below.

What the Green Building Technologies course does do, however, is provide students with knowledge and skills in several areas, such as a general understanding of principles and technologies used in green building, review of green materials and techniques for projects, and an understanding of the processes to get a building certified through LEED and how to become a LEED-accredited professional.

This course builds on and specifically compliments other STLCC courses in the Architectural Technology program, such as Design & Production I, II, and III. The completion of the Associate in Applied Science degree helps prepare students for careers in occupations such as Architectural Technicians, Interior Designers, Construction-Related trades, Facility Management, Energy Auditors, Building Retrofitters, Landscaping, Carpenters, and Roofers.



LEED Green Associate (GA) Exam Preparation & LEED Core Concepts

An accompaniment course to the Green Building Technologies course is the LEED Green Associate (GA) Exam Preparation & LEED Core Concepts course (CONS 701).

The LEED GA Exam Preparation & LEED Core Concepts course focuses primarily on preparing students for the LEED GA Exam, along with outlining LEED Core Concepts. It provides an introduction to LEED and the recognized LEED Core Concepts, while introducing methods of sustainable project delivery and green building principals.

This course is an exam preparation course and not to be confused with the specific courses certifying one to become a LEED GA through the U.S. Green Building Council (USGBC). That particular accreditation is obtained in one of two ways. Students must either take a LEED GA course through the USGBC covering information about LEED rating systems, building types and methodologies or they must gain LEED project experience and provide a letter of proof. Once either of these measures is met, one must take a computerized exam designed by the USGBC. It is this exam which the STLCC course is preparing students to pass.

Other courses or programs offered at St. Louis Community College in the area of green include the Home Energy Auditor Training, Sustainable Construction, Automotive and Diesel Technology, and Brownfield Job Training.

For more information about these course offerings and programs, visit the St. Louis Community College website at:

<http://www.stlcc.edu/>



LEED Accreditation

The LEED GA accreditation offered through USGBC is the newest LEED credential and denotes basic knowledge of green design, construction and operations. It is the required first step before taking the next step—LEED Accredited Professional (AP) Exam. The second level beyond that is the LEED AP+ with Specialty. There are five categories of specialties to choose from including:

- Building Design and Construction
- Interior Design and Construction
- Building Operations and Maintenance
- Homes
- Neighborhood Development

Like the LEED GA, the LEED AP+ with Specialty requires passing a 2-hour, 100-question exam designed by USGBC. It also requires work experience on a LEED project in order to qualify for the exam. One option to finding LEED project work experience is through the local Habitat for Humanity organizations. These organizations generally use the LEED rating system to ensure their buildings meet the LEED standard of construction and can provide a letter to prove a professional’s efforts on a LEED project making them eligible to take the LEED exam.

A LEED Professional Accreditation is a distinguishing mark for green building professionals in the marketplace and provides employers, customers, and other stakeholders with assurances of an individual’s level of competence in green building, operations, and development.

For more information about LEED and the accreditation process, visit the U.S. Green Building Council website at:

<http://www.usgbc.org/>

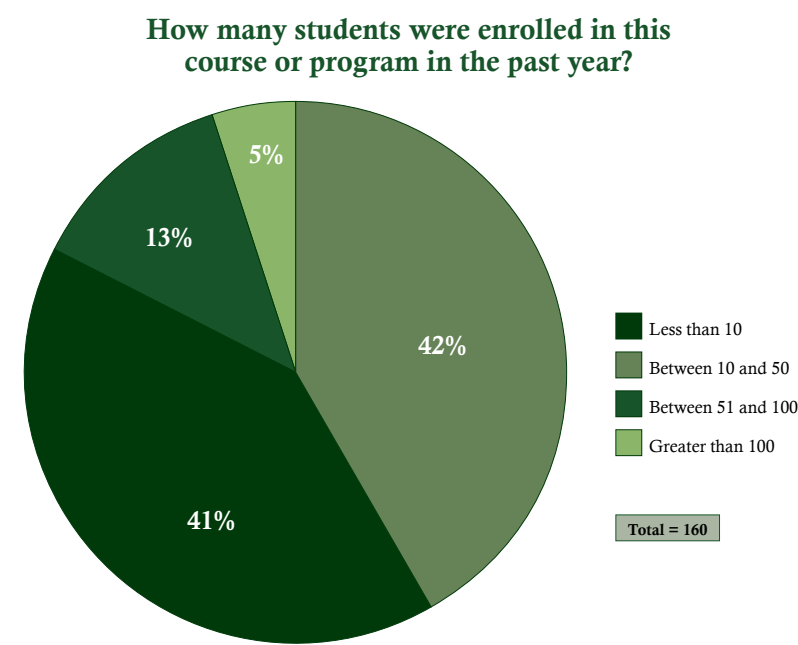


Student Details

The section of Student Details asked training providers questions related to student counts and completion of green courses or programs. The questions are dedicated to discovering previous student enrollment, expected student enrollment, student completers, and enrollment capacity.

Student Enrollment

A 2009 study conducted by the Pew Charitable Trusts found that in the U.S., between 1998 and 2007, clean energy jobs grew at a faster rate than overall jobs—9.1 percent for clean energy jobs compared to 3.7 percent for total jobs<sup>1</sup>. As these numbers project to increase, so too will the necessity to find a trained and qualified workforce.



Recognizing this trend, Missouri training providers have added green courses and programs to accommodate the increased interest in this growing sector.

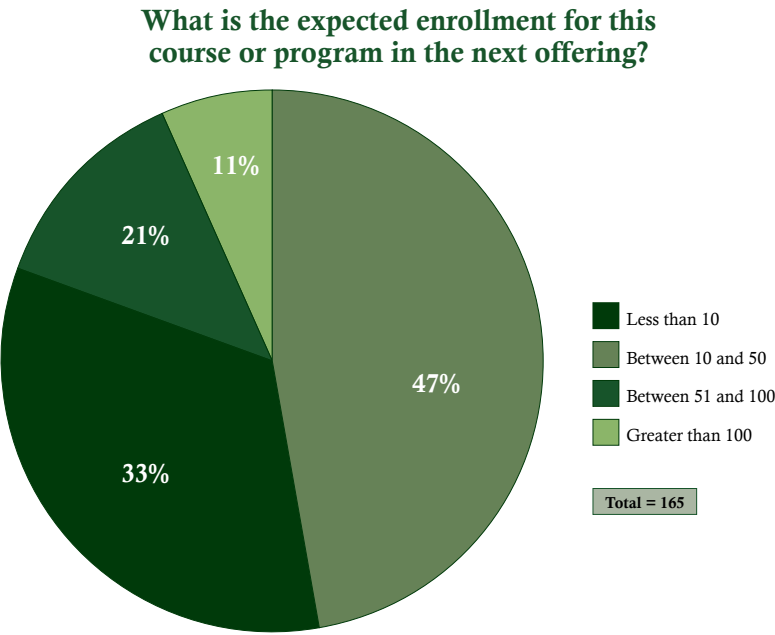
With new courses and programs added to curriculum, enrollment must be sufficient to justify the course or program offering.

Most courses or programs are witnessing fair to moderate enrollment as 42 percent of respondents say they had **between 10 and 50** students enrolled in the course or program in the past year. Another 13 percent experienced significant enrollment **between 51 and 100** and another 5 percent with enrollment **greater than 100**.

Expected Student Enrollment

Survey respondents were quite optimistic that enrollment would increase during the next offering period.

In fact, trainers expect an increase in the enrollment categories of **between 10 and 50**, **between 51 and 100** and the **greater than 100**. Likewise, they expect a decrease in the **less than 10** category, indicating an expectation that enrollment for green courses and programs will continue to see growth in the next course offering period.



<sup>1</sup> Pew Charitable Trusts, *The Clean Energy Economy*, 2009





Student Completers

While student enrollment at all of Missouri’s public and private education institutions has seen a dramatic rise (up 12% since 2005), it is those who graduate and acquire the necessary accreditation which employers desire.

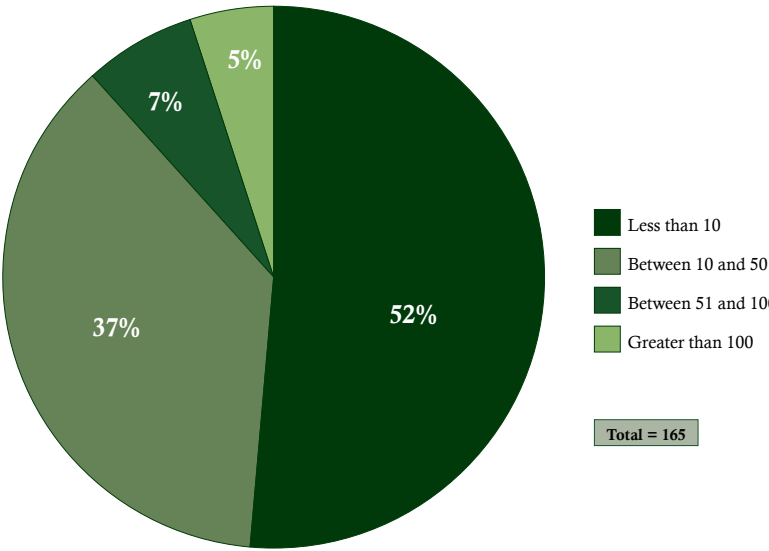
Though there is no historical data for enrollment in Missouri’s green training courses or programs, results of completers for the 2010 Missouri Training Provider Survey indicate a lag in graduates. Over half of respondents said they had *less than 10* (52%) completers in the past year.

Recall, results from the previous section in which over half of courses or programs have been offered either *less than a year* or *between 1 to 2 years* (51%). The implication is that the green courses or programs are relatively new causing a current lag in graduates.

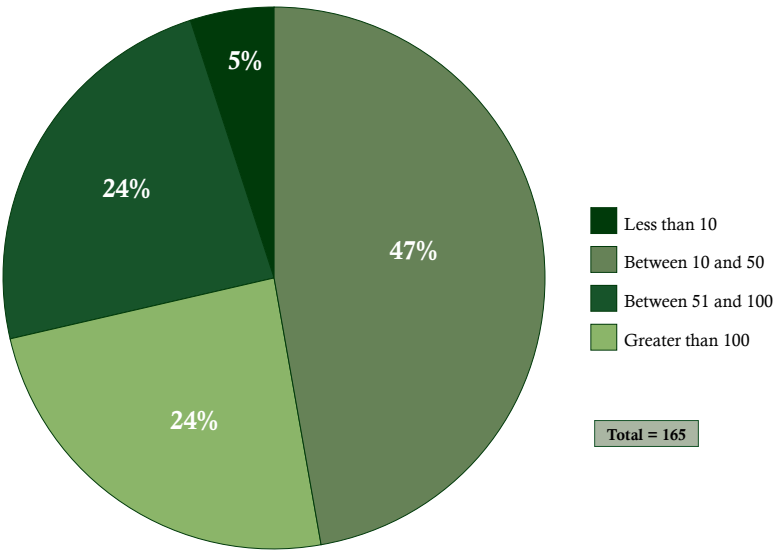
If respondents are correct in anticipating that expected enrollment will surpass previous enrollment (see graph below), future completers should increase as well.

For now, though, results show a very small portion of courses or programs with significant numbers of graduates. Only 5 percent responded they had *greater than 100* completers and 7 percent *between 51 and 100*.

How many students completed the requirements of this training course or program in the past year?



What is the overall enrollment capacity for the course or program?



While employment in many sectors of the economy have contracted recently, growth is occurring in some areas of the green sector. Based upon survey results, many training and education providers have already seized upon demand for workers by offering green training. Allowing added capacity to train and educate more students for these careers as needs increase helps make Missouri more green job-ready.

Enrollment Capacity

If student enrollment does rise as anticipated (see expected student enrollment on previous page), training and education institutions appear prepared to enroll and train more students.

According to respondents regarding enrollment capacity, Missouri institutions have the capacity to increase enrollment. Capacity rates are higher for the following ranges when compared to previous enrollment responses in the each of the following ranges: *between 10 and 50* (47% vs. 42%), *between 51 and 100* (24% vs. 13%) and *greater than 100* (24% vs. 5%).

Skills and Graduate Placement

The section of Skills and Graduate Placement asked training providers questions related to skills, teaching tools, and placement opportunities. The questions are dedicated to skills attained through training, teaching tools used for the course or program, placement of graduates, and type of jobs the training is preparing students for.

Skills Acquired

Actual skills acquired from a training course or program can be difficult to measure. However, respondents were asked to list the top 3 skills a student would gain from a green course or program. The responses were coded and classified into 13 categories. Skills ranged from the very specific, such as “installing geothermal HVAC systems”—classified as *Understanding & Use of Alternative Energy*—to broader skills, such as “green business planning”—classified as *Green Business Practices*. Each skill was assigned one category with a total of 474 skill responses.

While many responses could be classified into multiple categories, each skill was assigned just one category based on its direct function and relevancy to that category. For example, “installing geothermal HVAC systems” could legitimately be classified in 2-3 categories, but its direct function is the application of alternative energy, i.e., geothermal.

The category which the most responses fell into was *Environmental Impact Awareness & Reduction Strategies* with 65 skills. These included skills such as reduction of material waste, life cycle assessment and environmental awareness.

What skills would a student gain from this training course or program? (Write in response—Please list top 3.)

Other skills with a significant number of responses were *Energy Auditing & Weatherization* (63), *Knowledge & Application of Alternative Energy* (54), *Natural Resource Management* (42), and *Green Construction & Design* (39).

Specific skill descriptions, such as these provided by trainers, enable stakeholders to link program to employer and student to job.



The following are examples of the specific skill responses coded in broader categories:

Energy Auditing & Weatherization

- operation of blower door
- calculate air loss and leakage
- understand how building design, HVAC and material selection influence indoor environment

Natural Resource Management

- sustainable landscaping & agriculture
- water quality management
- principles of soil & water conservation

Knowledge & Application of Alternative Energy

- install commercial/residential solar panels
- diagnostic skill & repair of wind turbines
- install high efficiency mechanical systems & ground-source heat pumps

Green Construction & Design

- small office energy design
- LEED building certified knowledge
- construction safety + OSHA training

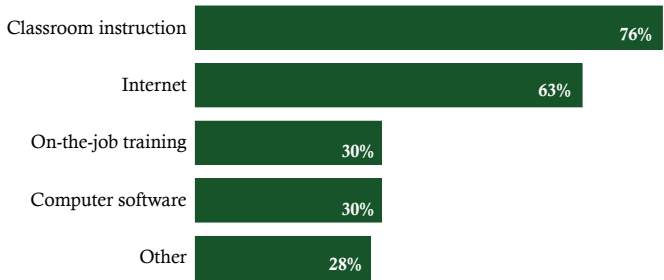
Teaching Tools

The teaching tools instructors traditionally use today were most often cited in the training of the green workers of tomorrow. Nearly three-quarters of the green courses or programs use *classroom instruction* (76%), followed by the *Internet* (63%), *on-the-job training* (30%), and *computer software* (30%).

Respondents of both 2- and 4-year programs said *classroom instruction* and *Internet* were the most common tools used for green training and at similar rates. However, for *on-the-job training* and *computer software*, there was a significant difference in results between 2- and 4-year institutions.

Four-year institutions utilize *on-the-job training* at a far greater rate than 2-years (43% vs. 22%). Likewise for *computer software*, where 4-years cited this as a teaching tool more often than 2-years (37% vs. 25%).

Which of the following tools are used to teach this course or program? (Select all that apply.)

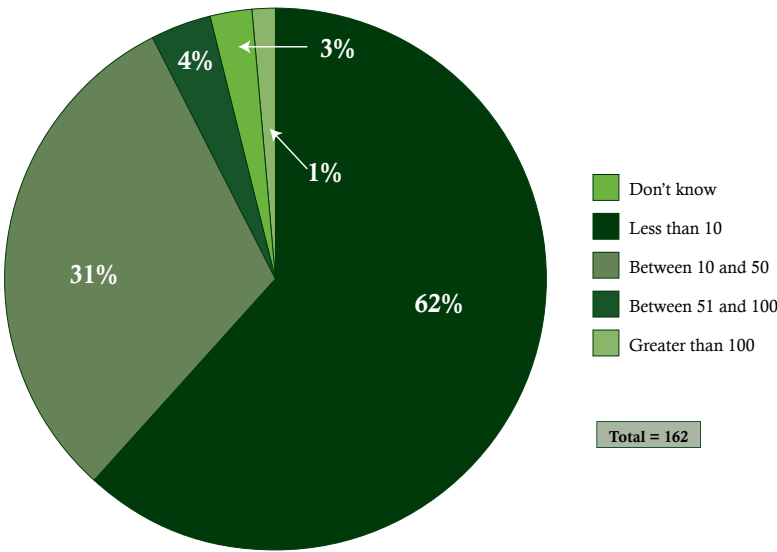


Graduate Placement

The goal of any training or education program is ultimately to prepare students to obtain employment in their field of study. For now, much of future employment in green careers will be predicated on how Missouri addresses issues like renewable energy, resource management, and sustainable manufacturing.

Results of the survey reflect this reality as well as tight labor market conditions in general. Graduates attaining employment in their green field of study are currently at a minimal level. Most trainers responded *less than 10* (62%) graduates have found jobs in their field of training in the past year. There was success for some programs, though, as 31 percent of trainers said *between 10 and 50* graduates have found jobs in the past year.

How many graduates of this training course or program have obtained a job related to their field of training in the past year?



The majority of those programs which placed *between 10 and 50* graduates with employment came from Missouri's 2-year institutions (64%), with the remaining from either 4-years (30%) or the combination of apprenticeship programs and WIA providers (6%).

As uncertainty in labor markets ease and depending on whether or not policymakers approach green jobs as an economic development tool or something more, these training programs could experience an increase in placing graduates with employment in the not so distant future.

One area where demand for workers nationwide is on the rise is in the solar industry. With's Missouri's renewable energy mandate, demands in the Show-Me state for trained workers in this industry should increase as well.

Type of Jobs

Similar to skills questions, survey respondents were asked to list the top 3 jobs the green training course or program prepares students for. These results were coded and classified into a specific O\*NET occupation title.

The O\*NET program is the nation's primary source of occupational information. The O\*NET database contains information on hundreds of occupations, including descriptions of tasks, knowledge, education and related occupations. The O\*NET program has also identified green occupations, many found in training provider results.

In addition to the O\*NET list of green-identified occupations, Missouri developed its own list of green-identified occupations. This list was based in part from the O\*NET list, as well as from the list of green occupations identified by respondents in the first ever Missouri Green Jobs Report, released at the end of 2009.

There were a total of 105 unique job titles assigned to the 287 responses provided in the 2010 Missouri Green Training Provider Survey. Of those 105 coded job titles, 68 were in the O\*NET list of green-identified titles while 63 were in Missouri's green-identified list.

Though most job titles in the training provider survey were also in the O\*NET and Missouri green-identified list, a significant number were not. It is those that were not found between the lists which can generally be considered "partial green" occupations. These "partial green" occupations usually add a layer of green training or education to functions of existing jobs. Examples of these type of jobs from the top 20 job list to the right includes *Construction Laborers*, *Sales Representatives* and *Automotive Service Technicians and Mechanics*. While core functions of these jobs may not be completely green in nature, depending on the type of project, material, or equipment used, part of the job function might be considered green.

However, perhaps no jobs exemplify actual green jobs more than the top three: *Sustainability Specialists* (21), *Energy Auditors* (19) and *Weatherization Installers & Technicians* (18).

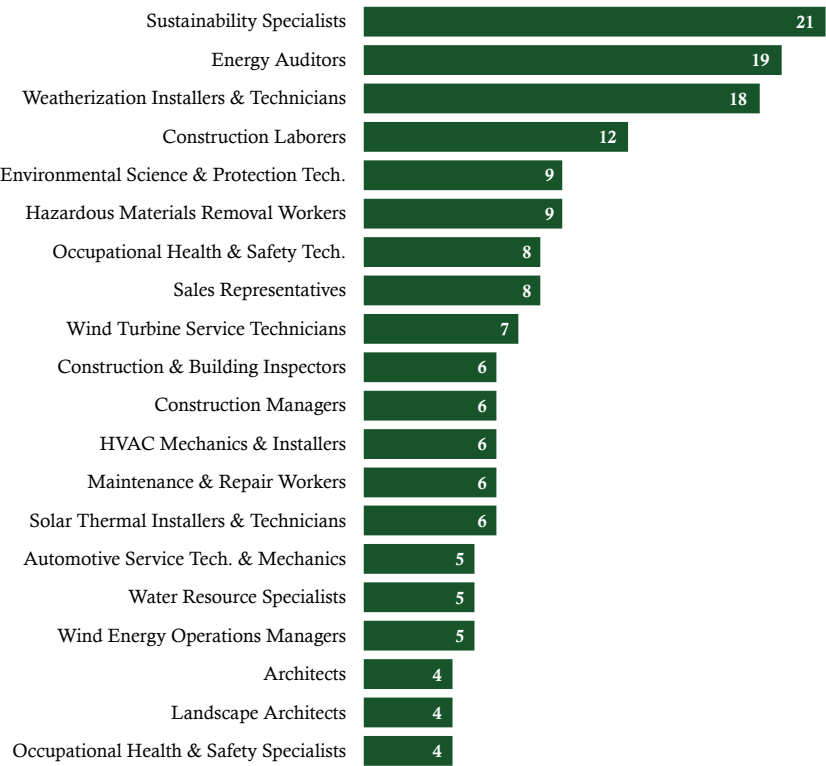
Examining job projection data of the list to the right reveals several jobs will have sustained growth over the next ten years.

The following occupations identified in the survey are projected to grow over the next ten-year period:

- *Maintenance & Repair Workers* (+6,010)
  - *Construction Laborers* (+840)
  - *HVAC Mechanics & Installers* (+527)
- *Construction Managers* (+250)
  - *Automotive Service Tech. & Mechanics* (+151)
  - *Construction & Building Inspectors* (+140)

Jobs are certainly the key component to economic recovery, but the recognition that training and educating the workers of the future allows for the best success in stabilizing a recovery. Currently, jobs that green training courses and programs are preparing workers for consist of a mixture of existing occupations, along with new and emerging green occupations. This balance will benefit Missouri's current and future employers if the green sector continues to outpace total job growth, as well as help replenish workers in traditional careers which add green layers of training.

What job is this training course or program preparing students for? (Write in response—Please list top 3.)





## Institutional Practices

The section of Institutional Practices asked training providers questions related to the training provider’s institutional use of green practices and initiatives. The questions are dedicated to discovering whether the institution supports sustainability efforts and what specific green practices are utilized at the institution.

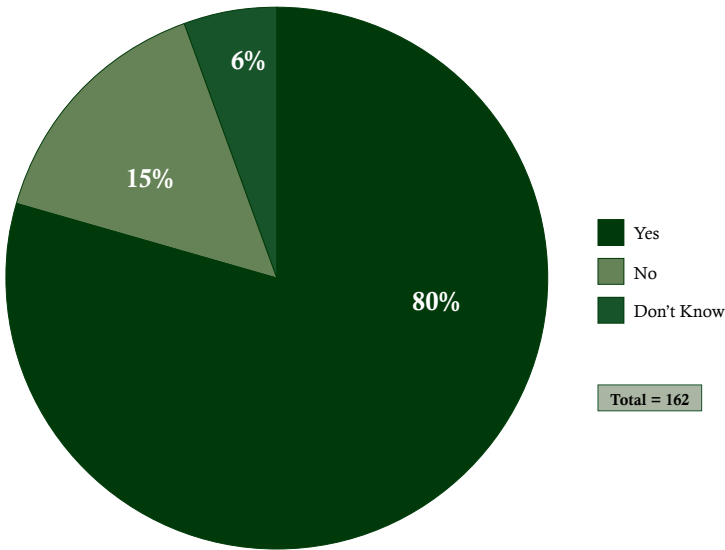
This section also contains details about a Master’s of Sustainability program at St. Louis University, which is one of only two of its kind in the U.S. This two-year Master’s degree program crosses numerous disciplines in the field of sustainability and offers a choice of three different career tracks.

### Sustainability Efforts

While the primary focus of the 2010 Missouri Green Training Provider Survey was to discover information about green training courses and programs, there were also questions designed to discover the training institution’s efforts in sustainability.

With threats of climate change and unstable energy supplies, sustainability efforts have become rather mainstream in the U.S. While the private sector contends with the sustainability issue from the perspective of cost control, higher education institutions often view it as part of their mission. This is apparent from survey results of the training provider survey, as 80 percent of respondents indicated their institution has some type of sustainability committee or advisory council supporting sustainability efforts.

**Does your institution have a sustainable committee supporting participation in sustainability efforts such as recycling or energy reduction?**



Two-year institutions accounted for 64 percent saying they did have a sustainability committee, followed by 4-years at 32 percent. A combination of private business and technical schools, apprenticeship programs, and WIA providers consisted of the remaining 4 percent responding in the affirmative.

One institution in Missouri has taken their sustainability efforts and developed an entire Master's degree program around this issue. The program is the only such offering in the Midwest and just one of two currently offered nationally.

### Highlighted Program in Sustainability: St. Louis University

The Master’s of Sustainability degree program at Saint Louis University (SLU) is a cross disciplinary degree integrating knowledge on sustainable business practices, effective public policy processes and innovative design and engineering approaches. The program began in the fall 2010 and is the first of its kind in the Midwest. It is being conducted through SLU’s Center for Sustainability.

The program was made possible through a \$5 million grant from the Alberici Foundation, which created the Center for Sustainability. The funds also allows \$1 million for environmental research, focusing on sustainable research projects and initiatives.

Students of the interdisciplinary, two-year program will explore advanced green practices in business, engineering and urban planning. A minimum of 35 credit hours is required for the SLU Master’s of Sustainability degree.

The first year of the program will focus on more basic sustainability topics. Some of the course offerings in year one include Sustainable Development, Sustainable Business Practices, Environmental Aspects of Sustainability and Sustainability in Engineering.

In the second year, students can choose from three different career tracks: Sustainable Enterprise Development (Business); Engineering and Technology (Engineering); and Sustainable Development Policy and Practice (Public Policy and Social Work).

Depending on the career track one chooses to pursue in this program, students select from some of the following courses in year two: Strategy and Sustainability, Sustainable Supply Chain Methods, Sustainable Product Design and Engineering, Sustainable Energy Technologies I & II, International Social Work, Sustainable Economic Development, and Human Behavior and the Environment.

Each career track concludes with a field experience designed to immerse the candidate into a practitioner role inside an organization or group that connects to their respective discipline.

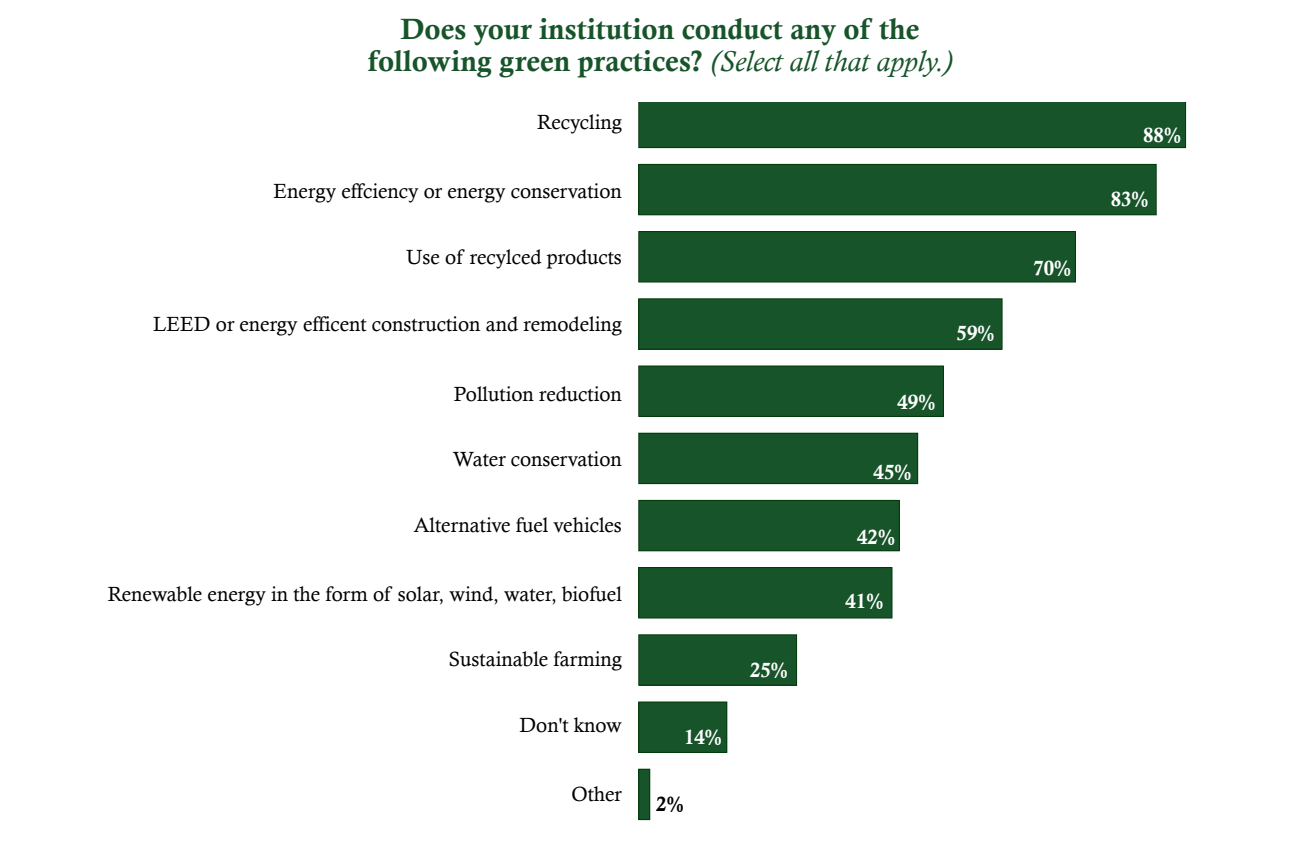
For a full listing of required and elective courses for each career track, visit SLU’s Center for Sustainability website at:

<http://www.slu.edu>



Institutional Green Practices

Respondents were asked to select those specific green practices their institution is conducting. They were allowed to select as many as applied. Over 50 percent of respondents indicated their institution conducted the following green practices: *recycling* (88%), *energy efficiency or energy conservation* (83%), *use of recycled products* (70%), and *LEED or energy efficient construction or remodeling* (59%).



Results varied considerably by institution type. Four-year institutions are conducting green practices at higher rates for all practices. The green practice they’re conducting at the least frequency is *sustainable farming*, with 67 percent implementing this practice.

Missouri’s four-year institutions are conducting the following green practices at greater rates, when compared to two-years: *use of recycled products* (91% vs. 61%), *LEED or energy efficient construction and remodeling* (84% vs. 48%), *pollution reduction* (78% vs. 37%), and *water conservation* (71% vs. 34%).







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